

FARM REPORT



In This Issue:

Corn Silage Harvest Tips	2
Growing Cover Crops in the Northeast	3
Chopping Immature Corn for Silage	4
What's Your Grass Telling You?	5
Cornell Nutrition Conference Oct. 22-24, 2019	6
What's Happening on the Farm	7



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FROM THE PRESIDENT'S DESK: ASSESSING COW COMFORT

Few things are more important than knowing how comfortable your cows are. I suppose if you asked the cow, she'd insist that her comfort is everything. We all understand the relationship between comfort, well-being, and herd health, but seldom do we take time to properly measure cow comfort.

The most useful indices of comfort are based on resting behavior. With on-farm assessment of well-being, % of cows lying down can be accurately measured (or its inverse, standing). Measures of lying behavior can be easily and reliably recorded within 2 hours during a typical farm visit and are consistent over time. Measures of lying behavior also distinguish among different housing systems and management routines.

The three "comfort indices" in use in the U.S. today rely primarily on the proportion of cows lying down. Taking time to observe and calculate a comfort index allows you to have a snapshot of the cows within a pen and will often flag potential problems that require further assessment.

Cow Comfort Index (CCI) is the most commonly-used index and is defined as the proportion of cows in contact with a stall that are lying down. In essence, it measures the cow's motivation to enter a free-stall and lie down; a lower CCI (i.e., more cows standing or perching) means more lameness. The CCI isn't associated with mean daily lying time, a common misconception. Well-managed

herds should have a CCI ≥ 0.85 , meaning that 85% or more of cows touching the stalls are lying down.

Stall Standing Index (SSI) is defined as the proportion of cows in contact with a stall that are standing – in other words, the inverse of CCI. Importantly, higher SSI reflects greater standing time throughout the day, and SSI > 0.20 is associated with stall standing times over 2 hours per day which often contributes to lameness. A well-managed herd would expect SSI ≤ 0.15 . I often use this index because it's related to lameness and practically it requires fewer cows to be counted, so it is more quickly assessed as you walk pens on a farm.

Stall Use Index (SUI) is the proportion of cows, not actively feeding, within a pen that are lying down. More than any other comfort index, it accurately reflects cow comfort within an overcrowded pen of cows, especially as stocking density approaches 130% of stalls or more. The key is that this index reflects cows that are "wasting their time" idling in alleys rather than actively eating or lying in a stall. Herds should have a SUI greater than 0.75. The SUI requires the most cow counting to calculate, but overall it is perhaps the most useful over a range of stocking density situations.

Rumination Index (RI) is the proportion of
 See **COMFORT**, Page 2

CORN SILAGE HARVEST 2019 TIPS

This year has been full of obstacles in our goal to produce high-quality corn silage. Spring was wet, and some corn wasn't planted until late June which tightens our window of growing degree days. In our area it seems the corn has tasseled and silked about two weeks ago, which means 45 days from silking would put harvest in the middle to end of September. It's vital to keep a close eye on your corn's development over the next couple of weeks. Determining whole plant dry matter will allow you to know when to harvest as the goal is 32-35% dry matter. This can be done by cutting 10 corn plants and either putting them through the chopper or a chipper then measuring dry matter. Utilize your team, whether it's the nutritionist, agronomist, or even seed dealer to help measure the dry matter.

Some corn fields will be playing a game of chicken on whether the plant reaches full maturity or the first frost comes. This will be a critical decision for a lot of dairy producers as the corn silage doesn't reach maturity then the ear won't be fully developed and will be low in starch. Since corn prices have risen over the summer, this means higher feed costs for the farmer for the next year. Though it is not all bleak, the corn plant has already laid down its digestible fiber so there will be feed for the cows. One way to help manage your risk is to lock in feed price for the year now and utilize by-products that can help fill in the gap where corn is usually utilized. As the chance for a frost increases it's important to make sure you have a plan in place to get the corn out of the field on time. Make sure necessary maintenance on all harvesting and packing equipment is completed and have backup parts to make breakdowns as short as possible.

When you do start to harvest, make sure you are checking the theoretical length of cut (TLC) and processing of the corn silage. The goal for TLC is $\frac{3}{4}$ to 1 inch and for the processing to crack the kernel multiple times. Take time when you first get started and check often to make sure the feed being put up is going to maximize efficiency in the cow. Use an inoculant to help drive the correct fermentation so there is limited spoilage. It will be a rush when harvest starts but make sure to pack the corn silage so it removes as much oxygen as possible and limits wasted feed. This year's corn silage is not ideal but taking steps to harvest at optimal dry matter, chopping and processing correctly, and then storing it to limit spoilage will allow for a good feed source for the year.

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COMFORT, Continued from Page 1

cows ruminating that are lying down. The RI has been validated against daily rumination time. On average throughout the day, you should expect to see 50 to 60% of cows ruminating when lying in the stall. There are times throughout the day when this percentage will be higher or lower. Observe at least 20 cows that are neither eating nor sleeping. We have observed a positive correlation between RI and daily rumination time in lactating cows. So, if you observe about 50% of cows ruminating, you can be reasonably sure that the cows are ruminating sufficiently – ordinarily 7 to 8 hours daily.

These indices should be measured when cows are motivated to lie down. Common recommendations include approximately 2 hours before or 1 hour after milking. With continued low milk prices and more expensive feed on the horizon, carefully monitoring cow comfort will be more important than ever to a farm's bottom line!

— Rick Grant
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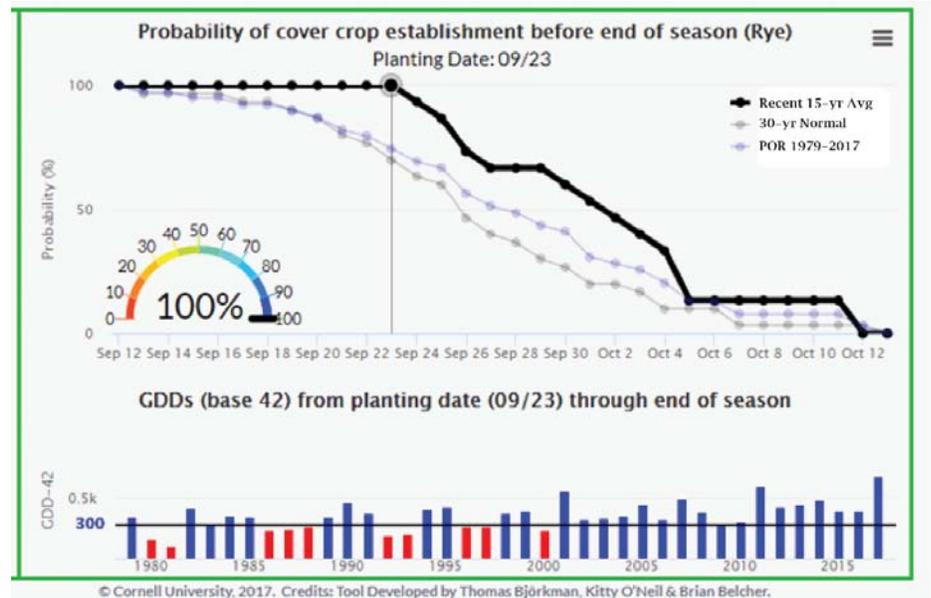
GROWING COVER CROPS IN THE NORTHEAST

As the end of summer approaches and corn harvest is just around the corner, it's a good time to talk cover crops. There are many reasons to consider cover crops, and if you've never planted them before, think about trying them on a small scale to see how they could fit into your system.

In my past few articles, I discussed our edge-of-field research projects, I highlighted that the majority of nutrient losses occur during the nongrowing season (loosely defined as November through April). If you have highly erodible land that will be fallow over winter and/or apply manure in the fall following corn harvest, planting a cover crop can help keep those nutrients in the field for the following growing season.

Establishing a cover crop after corn harvest will provide valuable protection for the soil from the erosive forces of rain, and the root system can help hold those valuable top few inches of soil in place during rain and snowmelt runoff events. The presence of vegetation will also slow the velocity of surface runoff. By limiting the amount of erosion that occurs, you're protecting manure from being washed away and keeping the high-value, top few inches of soil that are enriched with organic matter and nutrients (especially phosphorus) in place.

In addition to the erosion protection benefits, your cover crop will take up residual soil nitrogen from fertilizer applications and organic matter mineralization during the growing season, as well as the immediately available N from fall manure applications. This is a clear case of a win-win as much of that N would be lost to the surrounding environment



through leaching and surface runoff processes before it could be used in the next growing season.

Cornell University researchers looked at 31 studies around the country that compared N leaching losses from fields planted with non-legume cover crops and those left fallow, and calculated an average of 70% reduction in N losses from the fields with cover crops relative to those left fallow. To put it in more practical terms, research in New York by the Cornell University Nutrient Management Spear Program on four different winter cereal cover crops, supports an estimate of 20-30 lb./A of N taken up by the cover crop during fall growth following corn silage harvest.

The biggest challenge to successfully incorporating cover crops into your rotation is getting them planted early enough in the fall to allow for enough growth to be able to reap the benefits of ground cover and nutrient sequestration. If you can get a cover crop in by mid-September, triticale is a high-quality forage that could be harvested in the spring before planting

corn. If you find yourself planting later than that, cereal rye (AKA winter rye) is the hardiest option; we've had success at Miner Institute in getting a decent stand in research plots that were planted as late as mid-October, though planting that late carries a risk depending on the weather.

While not as high in feed quality as triticale, rye could also be harvested for forage, or killed and left in place to release the stored nutrients and organic matter back to the soil. Be sure to harvest or kill rye early enough in spring as growth can occur very rapidly and use water and nutrients that may be needed by the following corn silage crop. Also, if the rye becomes too mature before it's killed it could cause N deficit early in the season as it decomposes in the soil.

Climate Smart Farming (Cornell University) created a web-based tool (<http://climatesmartfarming.org/tools/csf-winter-cover-crop-planting-scheduler/>) to give farmers an idea of how likely it is that a rye stand will be

See **COVER CROPS**, Page 7

CHOPPING IMMATURE CORN FOR SILAGE

If you planted corn after mid-June you probably figured it might end like this: Frost on the way and the kernels are still in the milk stage. So, what to do? First, don't chop an immature crop based solely on a forecast of frost: We all know that (on very rare occasions) weather forecasts are inaccurate. Every day your crop remains in the field it's gaining dry matter, and since much of this dry matter accumulation is in the grain the crop is also increasing in quality. Immature corn also has a bit of built-in frost protection, so after a light frost singes the top leaves the rest of the plant may be still alive and making progress. The leaves only make up 10-12% of the yield on a corn plant at 32-35% whole plant DM, perhaps 15% with leafy-gene hybrids. Therefore, don't assume that whole plant dry matter is plummeting following a killing frost because most of the yield — and therefore most of the plant moisture — is in the ear and the stalk.

Proper harvest management of immature corn is a tricky business! Ideally you want to wait until the crop is at least 30% DM to prevent excessive effluent losses. But if the ears are in the milk or dough stage and the ear is tightly wrapped by the husks, a frost that kills the entire plant can result in ear mold formation within days. Often a killing frost is followed by a period of sunny weather — and a dead corn plant + pleasant weather is a perfect setup for ear molds.

My recommendation on the use of silage inoculants is simple: Every crop, every year. But using an inoculant may be particularly important following frost, which can kill the naturally occurring fermentation bacteria on your corn plants. Use a research-proven product at the recommended application rate. There's a difference of opinion on the use of silage inoculants containing *L. buchneri* on immature corn. My suggestion: Read the product label, and if your corn is likely to be lower in dry matter (wetter) than the minimum recommended DM for that *L. buchneri* product it may be better to use a standard (homofermentative) inoculant.

— E.T.

COW CUDDLING

A farm in N.Y.'s Finger Lakes is offering "cow cuddling" sessions for \$75 per hour. According to information from the National Institutes of Health, cow cuddling is stress-reducing and is the "hottest trend" in wellness. A cow has a higher body temperature and lower heart rate than do humans, so getting up close and personal supposedly results in a "relaxing experience". Though not necessarily for the cow.

Over the years I've spent a lot of time around cows, beginning with hand-milking two Jerseys at the horse and pony ranch where I worked as a teenager. I've observed a wide variety of bovine characteristics but cuddly isn't among them. However, I find it noteworthy that the farm offering cow-cuddling sessions has Jerseys. When Miner Institute had a split herd of Holsteins and Jerseys the behavior differences between the two breeds were obvious. Walk into a stocked pasture on a hot summer day and the Holsteins would remain lying in the shade of a tree, staring balefully at the intruder ("What does he want?") while the Jerseys, out and about and munching on grass, would mosey over to check out the visitor. While the cuddliness quotient of a Jersey may be higher than that of a Holstein (we will make no further mention of Ayrshires) that doesn't mean that a cow is as cuddly as a Labrador Retriever. Cow cuddling is a new wellness therapy; it will be interesting to see if it lasts.

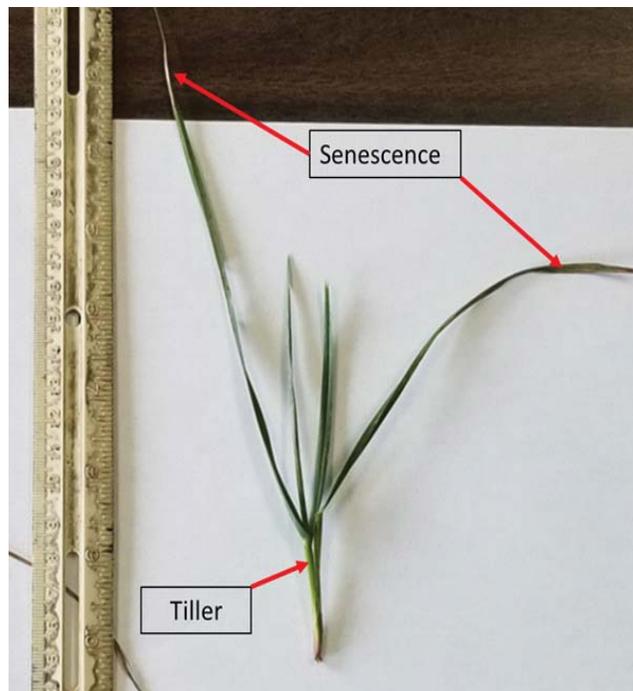
The Finger Lakes farm also offers a "Horse and Cow Experience Session", 90 minutes for \$300. According to the article, "Horses and cows have a special body language to communicate with humans. They can feel your happiness, sadness or anxiety. They will respond to you without any judgement." I can believe this, especially with horses. While working on the ranch those many years ago a filly I was trying to cure of her bad habits first bucked me off (one of her bad habits) and then kicked me (that was another), cracking a rib. She seemed to do so without any judgement.

— E.T.

WHAT'S YOUR GRASS TELLING YOU?

A dairy producer's primary concern is the health and vitality of the herd. A dairy producer who grazes his/her herd has an added layer of responsibility that requires a different set of skills that focuses on optimal grass management and high labor efficiency. When I was the student grazing dairy manager at the University of Missouri's Foremost Dairy Research Farm, I learned about the importance of a well-managed pasture and what aspects go into making management decisions. Throughout that time, I learned a lot about the plant and its growing characteristics so that I could effectively manage a pasture system. Similarly, a producer who understands how the plants in their pasture grow will be better able to make educated decisions without sacrificing quality or yield of the grass.

The plant uses photosynthesis to create carbohydrates and can be utilized in two different ways: growth and storage. Both are equally important to the plant, but growth has priority over storage. Grass grows as tillers, and for cool season grasses individual tillers segment into three to four visible leaves. As the fourth leaf begins to grow, the first leaf (the oldest) begins to senesce, or deteriorate. This can be seen by the naked eye and is shown by an increase in brown along the edge of the leaf. As it breaks down more, the leaf will wilt and eventually break off of the tiller. When photosynthesis creates more carbohydrates than the plant needs for growth, they are stored, specifically in the roots of stem-based grasses. This aspect can be more important for some climates compared to others, specifically those



Two tillers were taken from a perennial ryegrass pasture on the University of Missouri's Foremost Dairy Research Farm. As seen on tiller 1, senescence is beginning on the fourth leaf.

with colder, harsher winters like the Northeast. These stored carbohydrates are used for survival during stress such as defoliation (grazing) by giving the plant energy for the emergence of the first leaf. Frequent and close grazing can use up stored carbohydrates, making it difficult for the plant to renew growth, weakening the plant. This is why it is important to look at your grass and see what it is telling you. Is it time to graze or does it need more time?

One of the easiest ways to gauge the readiness of your stand is by the average leaf stage. This can be done quickly and easily. When I would walk the paddocks in Missouri, I would separate the paddock into four quadrants, and then randomly take tillers from each. From these samples, I would count the leaves and determine the average for the pasture. As a rule of thumb, cows should go on cool season grass-based pastures when the average leaf stage is between 2.5 and 3. The third leaf stage

is essential for the plant and the grazing cow. For the plant, this means it has stored enough residual carbohydrates to begin new growth after grazing; and for the cow, almost half of what the cow ingests resides in the third leaf. If the leaf stage is above 3 there will be a decrease in quality because of senescence, and if it is below 3, then there is an increased risk of harming the plant and decreased dry matter intake for the cow.

Along with the leaf stage, post-grazing height is another important yet simple management tool. For cool-season grasses, it is recommended to graze until the plants are around 2 inches tall. This amount of residual stubble stimulates faster regrowth, thus increasing yield while maintaining persistence of the stand. About 80% of the stored carbohydrate lies below this point, so grazing under this 2-inch residual can have detrimental effects on the plant to the point of death. This can cause the stored carbohydrates to deplete, thus the plant does not have enough energy for the growth of a new leaf. On the other hand, leaving more than a 2-inch post-grazing height will have an overall decrease in yield since there is still possible feed left on the paddock for the cows to graze.

Monitoring the leaf stage and post-grazing height of a pasture is vital for developing a high quality yet high yielding pasture system. Producers who understand the growth cycle of their grass can make better management decisions on when and how long to let their cows graze.

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- Biomarkers of Oxidative Stress in Transition Cows - Dr. Lorraine Sordillo, Michigan State University
- Where's the Beef? The Changing Face of Animal Agriculture in the Northeast - Dr. Mike Baker, Cornell University
- Dietary Lecithin Supplementation and Fatty Acid Digestibility in Cows - Dr. Joseph McFadden, Cornell University
- Managing Feed Variability to Improve Precision of Nutrient Delivery - Dr. Kristan Reed, Cornell University

REGISTRATION

\$200 per person before October 1

<https://www.cvent.com/events/2019-cornell-nutrition-conference/registration-9cbfd8845d484f968e4413c7263f2574.aspx?i=5173e0f9-19af-48dc-9b0e-857021044415&fq=true>



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WHAT'S HAPPENING ON THE FARM

The barn has grown quiet since the summer interns have returned home and my co-herdsmen have moved on to new adventures of their own. The cows have been busy, though, as they continue to test at over a 100 lb. herd average for the tenth month in a row! With cooler weather on the horizon, we're hopeful that they will hold up their record for the rest of the year. In addition to holding their 100 lb. average, they have surpassed a 32,000 lb. rolling herd average.

Once again, we're preparing for a very busy calving season during September, with 52 cows due to calve this month. With 25 heifers born in August we're going to have to get creative with where we put some of these hutches to make room for the coming influx of calves. The crops crew has been busy getting in the second cutting of grass, filling our newly-built bunker silo with a better-than-expected yield. Soon they will be preparing to harvest corn for silage, starting in mid- September.

As summer ends, so does my time at Miner Institute. I came here last year as a Summer Intern and had the amazing opportunity to stay on for an extra year to learn how to be a herdsman. I have learned so much this past year and I am so happy that I took a chance and came out to Chazy, NY. Especially in this last month, I feel as though I have gained so much confidence in myself and my abilities to care for the animals and I feel as though I can now take on anything. Thank you, Miner Institute, for providing this opportunity to me and I'll be bringing my new-found skills home to Maine to work on a dairy closer to home.



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COVER CROPS, Continued from Page 3

established before the end of the growing season based on planting date. The tool allows the user to put in their location and then choose between three cover crops (mustard, buckwheat, rye). The output is a graph that shows the likelihood of establishment for each day between September 12 and October 13. The screenshot of the output for a rye cover crop in Chazy, NY shows that planting 9/23 or before virtually guarantees a strong stand, while the odds of establishment drop to 53% if planted on 10/1, based on the 15-year average of growing degree days during this period. Also critical to improving your odds of a well-established, uniform stand is to plant with a drill. While broadcasting seed can work in some cases, research has shown that this is much less likely to result in a successful stand.

Although there are challenges to managing a successful cover crops program in the Northeast, the benefits to soil health and the surrounding environment are many and varied. Try it out on a field or two that is harvested early, prone to erosion, low in organic matter, or typically has high N fertilizer needs and see what kind of benefits there are. At the same time, you will get a better sense of what it would take to incorporate them on a larger scale on your farm.

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Closing Comment

A statistician is a person who says that if you ate a whole chicken and I ate nothing, on average we each ate half a chicken so neither of us should be hungry.

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